

# MSW LFG ENERGY PROJECT SUCCESS STORY

## KIEV #5 LANDFILL

### KIEV OBLAST

#### PROJECT OWNER: LNK, LLC

### OVERVIEW OF LANDFILL GAS (LFG) ENERGY PROJECT

In 2011, LNK, LLC worked with a team of Ukrainian researchers from the Gas Institute at Ukraine's National Academy of Sciences, to develop, design, and install the largest LFG energy project in Ukraine at the Kiev #5 Landfill. LNK utilizes 44 LFG vertical wells to collect approximately 500 cubic meters per hour of LFG to generate 900 Kilowatts (kW) of energy. A total of five (5) Tedom engine/generator sets (180 kW each) have been operating since April 1, 2012. LNK plans to add an additional 30 vertical LFG wells and a Jenbacher engine to generate an additional 1 MW in 2014.

This project is located at the Kiev #5 Landfill, which began filling in 1986 and is still open. The Kiev #5 Landfill has a designed area of waste placement totaling 65 hectares and is separated into two different areas. There are approximately seven million tonnes of waste-in-place at the site, which is expected to close in 2020.

LNK used the GMI Ukraine Landfill Gas Model to assess the project and GMI provided some assistance and technical information regarding the development and operation of the project. LNK has attended GMI workshops in the years past and representatives of GMI have visited the successful project.

### ESTIMATED PROJECT LIFETIME EMISSION REDUCTIONS: 0.94 MMTCO<sub>2</sub>E



## ENVIRONMENTAL BENEFITS

The LFG collection system and engines were installed in April 2012. This LFG energy project has the opportunity to collect and destroy an average of 4.8 million cubic meters of methane annually over the next 13 years. This is equivalent to emission reductions of more than 0.94 million tonnes of CO<sub>2</sub>eq over the project lifetime.

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Tonnes CO <sub>2</sub> eq from LFG Energy Project	30,460	75,821	75,821	75,821	75,821	75,821	75,821	75,821	75,821	75,821	75,821	75,821	75,821	75,821	75,821

*DISCLAIMER: The information and predictions contained within this poster are based on the data provided by the site owners and operators and site visits conducted by U.S. EPA. The Global Methane Initiative (GMI) cannot take responsibility for the accuracy of these data. It should be noted that conditions on landfills will vary with changes in waste input, management practices, engineering practices, and environmental conditions (particularly rainfall and temperature). GMI does not guarantee the quantity or quality of available landfill gas from the landfill site, which may vary from the values predicted in this report.*

# LFG AND ENERGY GENERATION

LNK and SCS Engineers estimated the amount of LFG generated by the Kiev #5 Landfill using the EPA's Ukraine LFG Model. Furthermore, LNK conducted a pump test to evaluate the LFG collection implementation of the LFG energy project. Other companies and organizations involved with the project include: Institute of Gas of the Ukrainian National Academy of Sciences, Ingas, Tedom S.A., General Electric Jenbacher, Monkor LLC, Polimermontazh LLC, and Arhubdkontrakt LLC.

## LFG Collection System and Energy Project:

- Number of vertical LFG wells: 44
- Current average flow of LFG: 462 m<sup>3</sup>/hr
- Percent methane in LFG: 50%
- System vacuum at blower: -4 kPa
- Pressure at blower outlet: 6.5 kPa
- Engines operating: 5 Tedom Engines (180 kW each)
- Electricity generation: 900 kW



LFG transmission pipeline



LNK, LLC representative takes LFG well readings



Landfill working face

## PROJECT ECONOMICS

- **Estimated cost (US\$/year):** \$2.45 Million
- **Estimated O&M cost (US\$/year):** \$237,000
- **Electricity sales (US\$/year):** Electricity is sold for 0.814 UAH/kWh (approximately US\$0.10/kWh), approximately US\$720,000/year
- **Other revenue streams:** Potential increase from electricity sales, pending approval of the Green Tariff legislation in Ukraine
- **Other project incentives:** LNK was able to take advantage of reduced taxes for purchase of equipment related to renewable energy generation
- **Estimated payback period (number of years):** 4

## FOR MORE INFORMATION

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